

WHAT IS CLAIMED IS:

1. A manufacturing method for a multilayer ceramic substrate,
comprising
providing an unsintered composite laminate comprising a sintered
plate of fired first ceramic functional material, a plurality of green layers for the
substrate which comprise a second ceramic functional material which is different
from said first ceramic functional material, at least one restriction layer are arranged
so as to contact a primary face of at least one of said green layers for the substrate
and which comprises a sintering-resistant material which does not sinter at the
sintering temperature of said second ceramic functional material, and at least one
wiring conductor associated with a green layer for the substrate, wherein said
sintered plate of fired first ceramic functional material; and is arranged so as to
extend along a primary face of a green layer for substrate
firing said unsintered composite laminate at a temperature at which
said second ceramic functional material is sintered.

2. A manufacturing method for a multilayer ceramic substrate according
to Claim 1, wherein in substantially parallel planes which are substantially
perpendicular to the lamination direction of said unsintered composite laminate, said
sintered plate has an area smaller than the area of the primary face of the green layer
for the substrate on which it is arranged.

3. A manufacturing method for a multilayer ceramic substrate according
to Claim 2, wherein a green layer for the substrate has a cavity, and the sintered plate
is disposed in said cavity.

4. A manufacturing method for a multilayer ceramic substrate according to Claim 3, wherein the sintered plate has a thickness which is less than the thickness of said cavity.

5. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein an external surface of said sintered plate has a terminal electrode thereon, and said wiring conductor is in electrical connect with said terminal electrode.

6. A manufacturing method for a multilayer ceramic substrate according to Claim 5, wherein said sintered plate is a capacitor element, an inductor element or a resistor element.

7. A manufacturing method for a multilayer ceramic substrate according to Claim 5, wherein said sintered plate comprises a laminate of a plurality of layers comprising said first ceramic functional material and has an internal conductor between a pair of adjacent layers thereof.

8. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein said sintered plate has a thickness of about 100 μm or less.

9. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein said unsintered composite laminate is fired at a temperature of about 1,000°C or less.

10. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein said first ceramic functional material has a sintering temperature

#102280" 08111660

SUB
RAI

higher than the firing temperature employed in firing said unsintered composite laminate.

11. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein two said restriction layers are present in said unsintered composite laminate and are arranged so as to be located at both ends in the direction of lamination of said unsintered composite laminate.

12. A manufacturing method for a multilayer ceramic substrate according to Claim 11, further comprising a step of removing said restriction layers after the firing of said unsintered composite laminate.

13. A manufacturing method for a multilayer ceramic substrate according to Claim 12, wherein said sintered plate has a thickness of about 100 μm or less, said unsintered composite laminate is fired at a temperature of about 1,000°C or less, and wherein said first ceramic functional material has a sintering temperature higher than the firing temperature employed in firing said unsintered composite laminate.

14. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein the green layers for the substrate comprise glass.

15. A manufacturing method for a multilayer ceramic substrate according to Claim 13, wherein the green layers for the substrate comprise a combination of ceramic insulation material and glass in which the glass is at least about 5 weight percent of the combination.

09041180-082701

Sub 14/5

16. A manufacturing method for a multilayer ceramic substrate according to Claim 1, further comprising producing said unsintered composite laminate.

17. A manufacturing method for a multilayer ceramic substrate according to Claim 15, further comprising producing said sintered plate of fired first ceramic functional material.

18. A manufacturing method for a multilayer ceramic substrate according to Claim 1, further comprising producing said sintered plate of fired first ceramic functional material.

19. A manufacturing method for a multilayer ceramic substrate according to Claim 1, wherein said unsintered composite laminate has a plurality of said sintered plates each of which is arranged so as to extend along a primary face of a green layer for substrate and each of which is individually selected from the group consisting of a capacitor element, an inductor element and a resistor element.

20. A multilayer ceramic substrate produced by a manufacturing method according to Claim 1.

09041180.0814660

5